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WHAT CAN THE ASIA-PACIFIC REGION EXPECT FROM THE NAIROBI CONFER--ETC(U)

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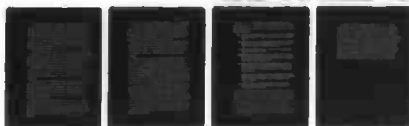
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July 15, 1981

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WHAT CAN THE ASIA-PACIFIC REGION EXPECT  
FROM THE NAIROBI CONFERENCE?

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The Rand Corporation

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The contemporary human predicament is marked by some absurd paradoxes. By 1980 the five-fold increase in the price of crude oil in real terms since 1972 had resulted in an annual expenditure of \$50 billion for oil imports by developing countries. The World Bank, concerned about the considerable strain on the balance of payment of oil importing developing countries, initiated a modest \$13 billion program of loans for the development of energy resources over the five-year period 1981-1985. Yet, according to SIPRI, the Stockholm International Peace Research Institute, in 1980 the Third World spent \$80 billion on defense.

The ten-year investment schedule for an expanded energy program in the oil importing developing countries, which the World Bank considers desirable and feasible, would require \$450 to \$500 billion (in 1980 dollars). According to SIPRI, the world spent \$500 billion in 1980 alone on defense. Obviously, the energy crisis is not due to an absolute lack of resources but to their misallocation. A modest transfer of ten percent of global defense expenditures--which would not leave any nation at the mercy of its enemies--to an energy resources development fund would advance considerably the modernization of the Third World and also reduce international tensions caused by the sharpening competition for natural resources.

Unfortunately, the time is not yet ripe for such a global "energy tithe." The proposal to transfer resources from armaments to development is not new. It has even been the object of special studies within the United Nations system.

It is easy to be angered or discouraged by the wasteful use of resources on military expenditures to the detriment of the world's poor, especially in developing countries. Pessimism is the prevailing mood of our times and belief in progress has given way to despair among those concerned with the human condition. Yet, factual evidence will support the assertion that humanity has recorded great achievements in the decades since World War II.

Unlike some contemporary prophets of doom and gloom, I believe that the eighteenth century philosophers of the Enlightenment would be thrilled to witness the role that reason is currently playing in human affairs. Despite the many horrors and inequities with which we are all familiar, greater numbers of people, everywhere, live better than ever before. Except for a few anachronistic aberrations, which cannot last, colonialism has been abolished, and so has slavery. There are, to be sure, some fifteen million refugees in the world today, or one out of every three hundred people alive, but they are not ignored by the international community. Neither are those who are the victims of drought, floods, or other calamities. Famines killing millions of people are a thing of the past, and so are major epidemics.

Slowly, public health and education are reaching remote backward areas which never had a clinic or school before. Few people live in total isolation from the outside world in this age of electronic marvels. While human rights are still in jeopardy in many places, their violation causes a global hue and cry. Few knowledgeable people would trade their present circumstances for those of their ancestors.

The accumulation of knowledge is making it possible to apply reason to the solution of human problems. It takes, of course, giant steps to translate insights into policies, but until very recently even the facts were not known. Only in the last three decades have innumerable national institutions and the United Nations system developed humanity's capacity to monitor global developments.

This recent information explosion and the growth of the technology facilitating the use of accumulating data is bound to have a beneficial impact in the long run. Without getting involved in a simplistic debate concerning the respective merits of market decisions versus central planning, it is clear that no rational solutions of global problems could be expected as long as humanity remained ignorant of its true circumstances.

The United Nations Conference on New and Renewable Sources of Energy should be viewed in this perspective. The very fact that it is being held is one of the rays of hope marking the dawn of a new

historical epoch, the future era of global management. We need not be reminded that prior to the twentieth century only a few superior minds, endowed with bold imagination, were able to see the human condition in global perspective.

It took centuries of seemingly utopian speculations and then the shock of World War I before it became possible to establish the League of Nations. Although that first experiment in international organization was unable to carry out its limited peace-keeping mission, its short existence was valuable. After World War II there was widespread readiness to establish and support a similar institution, the United Nations. Besides its peace-keeping functions, the new organization was given the broader task of enhancing human welfare.

The lessons of the Great Depression, which had spread misery from the industrialized nations to the rest of the world, the widespread suffering caused by World War II, and the indignation generated by the misery in which colonialism had left the great majority of the human race created awareness that the urgency of economic and social planning transcended national and ideological boundaries. International public opinion had become committed to the concept that all nations should modernize and all people should share in the benefits of that process. But how this could be achieved was far from obvious. Economic and social planning was new and controversial. Experience was lacking and factual knowledge almost non-existent. The efforts of a whole generation of students of human affairs had to be concentrated on overcoming humanity's ignorance of its situation. The United Nations system played a major role in the accumulation of factual data, analytic insights, and theoretical conceptualizations. Undoubtedly much more is known about the human condition at present than a generation ago.

While we were all learning, the world's rapidly increasing population and the growing requirements of expanding economies generated demands of unprecedented magnitude on the life-sustaining systems of our planet. Lacking cohesion as well as comprehension of the significance of exponential growth, the international community did not even attempt to develop a rational and efficient resources policy.



Global mismanagement prevailed unchecked until astronauts and cosmonauts gave us a first chance to see our small "Spaceship Earth" from afar and made us realize how fragile the basis for human survival was. Reflecting this awakening, the United Nations initiated the historical series of world conferences of which the first was the 1972 Stockholm meeting on the human environment. These are extensive surveys which are making a major contribution to the broadening of the scope of human consciousness on issues that require global management, such as environment, food, population, water desertification, habitat, the NIEO, disarmament, agrarian reform and rural development, science and technology, and most recently energy.

Participating nations which represent an overwhelming majority of the world's population have been induced by these conferences to examine these global problems from the perspective of their domestic interests, to develop national policies, and to define their positions in the broader setting of the international community.

Pessimists and skeptics could argue that the practical impact of this first decade of global stocktaking has been very limited. This is not so. Actually, a vast store of factual data, analytic insights, and innovative ideas have been accumulated as the result of these world conferences. Many governments have created new agencies, committees, and study groups concerned with major issues of global relevance. Besides their intrinsic educational value, such efforts, without precedent in many countries, are creating the human and institutional foundations for the new patterns of global management, which will make it possible to enhance the welfare of the world's population in the twenty-first century and beyond.

Far from being slow, the preparatory stage for this new era of global management has made amazingly fast progress in a very short time. Issues that were only discussed in small circles of specialists are now well understood items of the global agenda.

Viewed in this broader historical perspective, the forthcoming Nairobi Conference is a link in a long chain of actions that is preparing a better future for all humanity. Naturally, the August meeting cannot be expected to solve the world's current energy

problems. Like the preceding world conferences sponsored by the United Nations, if it is successful the Nairobi gathering will plant seeds that should bear fruit in the twenty-first century. What then, can the Asia-Pacific region expect from the Nairobi conference?

The needs of the Asia-Pacific region are clear. Like the rest of the world, it has to achieve in the most rational and efficient way possible the transition from dependence on petroleum products to reliance on alternative sources of energy. But the crisis caused by the oil price increases does not have the same significance for the developed and developing countries of the region.

In the developed countries, more than three-quarters of the population is urban. Its modern life style requires energy for a wide variety of end-uses. Electricity for household amenities and liquid fuels for transportation seem indispensable. Alternative sources of energy would have to supply the same end-uses as are currently established in these industrial societies, if major socioeconomic dislocations are to be avoided.

Yet the energy needs of developing societies should perhaps have higher priority, because it is imperative that they overcome extreme poverty through rapid modernization. In the developing countries of the Asia-Pacific region about three-quarters of the total population is rural. Their agricultural economies are still primarily dependent on traditional sources of energy, namely fuelwood and organic wastes. In the villages, transition to the use of petroleum products for cooking and lighting is a mark of progress. Electrification is still beyond the means of most village households and even of many city dwellers.

Could the development of new and renewable sources of energy help the developing countries of the Asia-Pacific region to bypass the age of oil and create new patterns of modernization and industrialization? Or should the developed countries of the region use their superior economic and technical resources to speed up their transition to new and renewable sources of energy, reduce their dependence on petroleum products, and thus liberate larger quantities of non-renewable fossil fuels for the economic growth needs of developing

countries? This dilemma obviously raises a host of ethical, political, economic, social, and technical questions.

The preparatory work for the Nairobi Conference has focused primarily on the state of the art of new and renewable energy technologies. This Regional Consultative Meeting has the task to identify central issues of particular concern to the region, develop regional options for transition to a broader mix of energy sources, seek to develop a regional consensus on proposals for consideration in Nairobi, and specify what assistance is considered necessary from the United Nations system for the development of a well-balanced program.

To place the contribution that new and renewable sources of energy can make in perspective, we have to understand the immense potential energy demand of the Asia-Pacific region. Its growth will be determined by two major trends, namely the conservation policies of the mature industrial countries of the region and the economic growth of the developing countries.

Conservation will not reduce the absolute volume of demand in the industrial countries but only slow down the rate of growth in their energy demand. Meanwhile demand in the developing countries will increase. Therefore the total volume of energy demand of the Asia-Pacific region will increase considerably. The long-term implications of this process are graphically illustrated by a study completed in November 1980 by the Institute of Energy Economics located here in Tokyo.

The Japanese analysts established that the level of commercial energy consumption per capita in 1978 in various countries of the region corresponds to their respective stages of economic development. Measured, in accordance with United Nations practice, in kg of coal equivalent per person, the values were 302 kg for Indonesia, 347 kg for Thailand, 364 kg for the Philippines, 726 kg for Malaysia, 1,178 kg for Taiwan, 1,384 kg for South Korea, 4,822 kg for New Zealand, and 6,819 kg for Australia.

The Institute of Energy Economics compared these figures with the per capita energy consumption of Japan at various points in time and concluded that Indonesia's per capita energy consumption is

equivalent to that of Japan in the take-off period of the 1880s, that of Thailand and the Philippines very close to Japan's around 1915, that of Taiwan and South Korea, which have reached a state of economic development equivalent to that of Japan between 1930 and 1960, is close to the Japanese per capita consumption in the latter half of the 1950s, that in New Zealand, where industrialization is lower than in Japan, per capita energy consumption is also lower, whereas in Australia, where per capita GNP and automobile ownership ratios to total population are higher than in Japan, energy consumption per capita is also higher.

Economic forecasts of future energy demand in the Asia-Pacific region would have to determine future rates of economic growth and population growth for each country and elasticities of energy consumption with respect to GNP or GDP. The reliability of such estimates is open to question. Many factors can distort the trends from which one extrapolates. But one should assume that eventually the rest of the Asia-Pacific region will reach a stage of economic development comparable to Japan's in the 1980s, although neither the paths that these processes of economic growth will follow nor the time they will require are predictable. There is no reason to believe that all possible paths by which the scientific and technological revolution of the last two centuries is spreading have been exhausted. Also, although the stage of economic development of certain countries, say Indonesia, may be comparable to that of Japan in 1880, it may not take those countries a century to reach Japan's present stage of economic development.

The present situation, where people in the United States and Canada use more than five times the global average of per capita energy consumption, while the people of the developing countries of Asia use only one-tenth of the global average of per capita energy consumption cannot last. It is merely a manifestation of the early stages of the economic revolution which is spreading around the globe at an uneven rate.

After seven years of research, involving 140 specialists, the Energy Systems Program Group of the International Institute for

Applied Systems Analysis concluded that "it is possible to provide enough energy for a world of eight billion people in the year 2030." But the study assumed that fifty years from now the people of the developing countries of Asia would use only 25 to 30 percent of the global average of per capita energy consumption, whereas the people of North America would still use four to five times the global average.

One need not anticipate with prophetic vision the shape of things to come in half a century, to assume that electronic mass-media, global air travel, and international education are creating everywhere attitudes and expectations which will make it impossible for people in North America to consume in the year 2030 fifteen to twenty times as much energy per capita as the people in the developing countries of Asia.

Differences in energy consumption of such magnitude would maintain a gap in life styles that the future generations in the Third World would find intolerable. The grandchildren of the present generation of villagers who are still living predominantly without the basic amenities that electricity provides--particularly light, TV, and food refrigeration--will not accept the perpetuation of these conditions.

Energy specialists argue that low demand is a major constraint on the expansion of electricity-generation capacity in developing countries. Evidently, poor people cannot afford the cost of connecting their homes to the distribution grid, the purchase of electrical appliances, and the charges for the electricity they would consume. Poverty is indeed an obstacle to electrification under current market conditions. But, looking fifty years ahead, the clamor for modernization is bound to reach such intensity that electricity will probably have to be provided to the poor as a social service.

The political pressure that this demand will put on the governments of developing countries will in turn have international repercussions that will make new global patterns of energy allocation imperative. To assume that global energy demand in 2030 will be

determined by the market mechanisms of 1980 requires excessive lack of imagination and vision. In fairness to the authors of the IIASA study, it should be mentioned that they observe, in passing, that failure of the developing countries to achieve their economic growth targets would increase global instability and "the probability for economic warfare in ways that are difficult to anticipate."

There is widespread agreement among energy specialists that new and renewable sources of energy will not provide a substantial substitute for conventional energy sources in the near- and medium-term. Coal and nuclear energy, the two major resources that can replace in part oil and gas during the next two decades, raise complex risk assessment, environmental, and economic problems.

The Nairobi Conference is not scheduled to discuss the transition from petroleum products to coal and nuclear power, but the Asia-Pacific region will undoubtedly face in the next twenty years a number of issues requiring co-operation among nations, on matters such as the creation of a coal market and of coal liquefaction plants, uranium enrichment facilities, and nuclear waste disposal sites, to name just a few salient ones.

The rational and efficient use of energy is also not on the Nairobi agenda, but the Regional Consultative Meeting could profitably exchange information on some very successful conservation policies implemented in the Asia-Pacific region in recent years.

The Governments of the Asia-Pacific region could make a genuine contribution to global energy management if they agreed on ways to remind the participants in the Nairobi Conference that new and renewable sources of energy can only contribute to the solution of the world's energy problem as part of a broader mix. If not in Nairobi then at a later date members of the United Nations will have to discuss how to facilitate the expanded use of coal and nuclear power in ways that would reduce to acceptable levels the various risks associated with these primary energy sources. How to maximize the rational and efficient use of energy should also be discussed eventually on a global basis under United Nations auspices, as conservation is of crucial importance in gaining the time needed for the eventual creation of a sustainable global energy system.

In view of the excellent preparatory work of the Secretariat of the Nairobi Conference, this Regional Consultative Meeting could concentrate its attention on the discussion of action-oriented priorities. Although from a technical point of view the development of all new and renewable energy sources deserves attention and is challenging to specialists, the practical importance of these energy sources varies greatly. In the developing countries of the Asia-Pacific region fuelwood and charcoal are still a dominant energy source for cooking and heating, and draught animals are still extremely important for agriculture and transportation.

Any significant contribution to a more efficient and rational use of these two energy sources would have an immediate impact on the lives of hundreds of millions of people. It would also reduce very substantially the rate of growth of demand for petroleum products, by slowing down the transition from fuelwood to kerosene and from the use of draught animals to mechanized agriculture and transportation.

Hydropower is an important renewable source of energy, but the technology for its utilization is mature. Knowledge of potential resources is usually adequate at the national level and international co-operation for the development of that resource has a well-established tradition.

Several other new and renewable sources of energy are only of marginal significance in terms of the total volume of energy that they could contribute under current conditions. There is danger in misunderstanding or overestimating the possible role of solar, wind, geothermal, and ocean power, or of oil shale, tar sands, and peat, because of the diversionary effect that excessive reliance on these energy sources could have.

What the Nairobi Conference could do for the Asia-Pacific region with regard to these exotic sources of energy is to help countries avoid duplication in research, development, and demonstration and coordinate collection of meteorological, geophysical, and oceanographic information. But these activities, although useful, will have only a marginal impact on the region's energy situation in the next two decades.



By contrast, fuelwood and draught animals are of such importance to a vast majority of the region's population, who live mostly in villages, that a successful international effort concerning these major energy sources would have an immediate and widespread impact. Obviously, forestry, animal husbandry, and home economics do not have the glamor of futuristic technology such as solar satellite power stations or ocean thermal energy conversion (OTEC).

But reforestation in accordance with sound ecological principles, and energy plantations whose quick-growing trees and shrubs are cultivated for areas suffering from extreme fuel shortages are of vital importance to villagers who cannot afford the cost of kerosene and to governments lacking the foreign exchange to import petroleum products.

Draught animals have many advantages over mechanized agriculture in the specific circumstances of Asian agriculture. Rural under-employment, the cost and availability of fuel especially in remote areas, the problem of maintenance and spare parts for machinery in societies lacking industrial infrastructure and technical skills make draught animals economically and socially attractive alternatives. For short-distance transportation, draught animals will also remain a useful option for a long time to come. As modern breeding methods and veterinary care can greatly improve the quality of the livestock, there is clearly room for regional co-operation in this field.

The efficient use of fuelwood and of draught animals can be substantially increased by the diffusion of simple technological innovations. Conventional cooking stoves use only about ten percent of the thermal energy of fuelwood. Improved stoves can be twice as efficient and would thus conserve half of the fuelwood currently used for cooking. The problem is technically simple but socially difficult, because of the lack of extension services for the promotion of the more efficient stoves. Similarly, the productivity of draught animals could be greatly improved by the development and distribution of more efficient agricultural implements, harnesses, hitching devices, and frames for pack animals.



In the July 7, 1981 version of the "Preliminary Draft of a Programme of Action," the alternate text proposed by China provides a particularly clear statement on what should be done to meet rural energy requirements:

- (a) Cultivate fast-growing trees that can be used as fuelwood; make rational use of forest by-products and agricultural wastes;
- (b) Popularize small-scale biogas digesters for use in peasant households to solve the problems of fuel and fertilizer and also to improve environmental hygiene;
- (c) Improve traditional rural cooking stoves; increase heat efficiency; conserve fuels;
- (d) Wherever possible, make full use of solar energy, e.g., solar cooker, solar water heater, agricultural by-product desiccator, passive solar house, etc., as well as use of solar cells in outlying pastures;
- (e) In the light of local conditions, make full use of indigenous energy sources; develop independent small-scale electricity supply system such as small-scale hydropower, wind power, and use of geothermal energy and industrial residual heat;
- (f) Improve animal husbandry practices to produce an increase in the quantity and quality of draught animals and improve different types of equipment used in conjunction with draught animals;
- (g) Enhance public scientific knowledge concerning rural energy; mobilize the masses to actively participate in the reform of rural energy.

The goal of the programme is to ensure that during a rather long period, the energy needs of the rural areas can be met on a sustainable basis in the light of the different situations in all countries so that by the year 2000, the surface of the Earth will be covered with more vegetation, the vicious circle of soil erosion can be broken, and the ecological imbalance can be gradually redressed. Within the next 5 years, emphasis should be placed on overcoming the serious shortage of fuelwood in the rural areas so as to start building up people's confidence that they can solve the rural energy problem in a self-reliant way.

Vigorous action concerning cultivation and use of fuelwood, breeding and employment of draught animals would contribute greatly to the welfare of the rural population of the Asia-Pacific region. It should be given top priority at the Nairobi Conference. Need we be reminded that the spraying of stagnant waters by WHO teams was also not a glamorous activity, but it virtually eliminated malaria and made an enormous contribution to human welfare? If the Nairobi Conference succeeds in the adoption of action programmes that would solve the fuelwood crisis which is threatening particularly the Asia-Pacific region and would increase the availability and efficiency of draught animals, it will become a historical landmark on the road toward a sustainable global energy system, even if it does not contribute significantly to the development of advanced energy technologies.

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